PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 45621-PT	**FOR FURTHER ACTION**	See Form PCT/IPEA/416
International application No. PCT/CA2004/001782	International filing date *(day/month/year)* 01 October 2004 (01-10-2004)	Priority date *(day/month/year)* 03 October 2003 (03-10-2003)
International Patent Classification (IPC) or national classification and IPC IPC: B22D 11/06 ***(2006.01)***, B22D 21/04 ***(2006.01)***		
Applicant ALCAN INTERNATIONAL LIMITED ET AL		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. [x] *(sent to the applicant and to the International Bureau)* a total of 3 sheets, as follows:
      [x] sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      [ ] sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. 1 and the Supplemental Box.
   b. [ ] *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s))
      , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).
4. This report contains indications relating to the following items:
   - [X] Box No. I Basis of the report
   - [ ] Box No. II Priority
   - [ ] Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - [ ] Box No. IV Lack of unity of invention
   - [x] Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - [ ] Box No. VI Certain documents cited
   - [x] Box No. VII Certain defects in the international application
   - [ ] Box No. VIII Certain observations on the international application

Date of submission of the demand 20 May 2005 (20-05-2005)	Date of completion of this report 1 February 2006 (01-02-2006)
Name and mailing address of the IPEA/CA Canadian Intellectual Property Office Place du Portage I, C114 - 1st Floor, Box PCT 50 Victoria Street Gatineau, Quebec K1A 0C9 Facsimile No.: 001(819)953-2476	Authorized officer Susan E. Woodhead (819) 997-2916

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/CA2004/001782

Box No. I Basis of the report

1. With regard to the **language**, this report is based on:

[x] the international application in the language in which it was filed

[ ] a translation of the international application into , which is the language of a translation furnished for the purposes of:

[ ] international search (Rules 12.3(a) and 23.1(b))

[ ] publication of the international application (Rule 12.4(a))

[ ] international preliminary examination (Rules 55.2(a) and/or 55.3(a))

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

[ ] the international application as originally filed/furnished

[x] the description:

[x] pages 1 to 13 as originally filed/furnished

[ ] pages* received by this Authority on

[ ] pages* received by this Authority on

[x] the claims:

[ ] pages as originally filed/furnished

[ ] pages* as amended (together with any statement) under Article 19

[x] pages* 14 to 16 received by this Authority on 20 May 2005 (20-05-2005)

[ ] pages* received by this Authority on

[x] the drawings:

[x] pages 1/6 to 6/6 as originally filed/furnished

[ ] pages* received by this Authority on

[ ] pages* received by this Authority on

[ ] a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. [ ] The amendments have resulted in the cancellation of:

[ ] the description, pages

[ ] the claims, Nos.

[ ] the drawings, sheets/figs

[ ] the sequence listing *(specify):*

[ ] any table(s) related to sequence listing *(specify):*

4. [ ] This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

[ ] the description, pages

[ ] the claims, Nos.

[ ] the drawings, sheets/figs

[ ] the sequence listing *(specify):*

[ ] any table(s) related to sequence listing *(specify):*

* *If item 4 applies, some or all of those sheets may be marked "superseded."*

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/CA2004/001782

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1 to 19	YES
	Claims	none	NO
Inventive step (IS)	Claims	1 to 19	YES
	Claims	none	NO
Industrial applicability (IA)	Claims	1 to 19	YES
	Claims	none	NO

2. Citations and explanations (Rule 70.7)

D1 US 4934443
D4 US 6063215

Novelty:
D1 describes an internally cooled cylindrical casting wheel as well as stating that other configurations such as a flat belt or caterpillar track chill surface may also be employed. Throughout the document reference is made to the chill surface being of steel, copper, or aluminum. Aluminum and its alloys are cited as materials having suitable thermal conductivity and wear characteristics for the casting surface.

The amended claims 1 to 19 meet the requirements of Article 33(2) PCT as endless belts of aluminum or aluminum alloy of thickness in the range of 1 to 2mm are not taught in the prior art.

Inventive Step:
D1 describes casting surfaces of aluminum and D4 describes an endless casting belt of typical thickness 1.27 to 3.81mm; however, the casting surface of D1 which is specifically noted as being aluminum is in the form of a wheel as opposed to an endless belt, and the endless belt of D4 is constructed of steel. The applicant has noted in his description on pages 8 and 9 the surprising discovery of aluminum being a suitable material for an endless casting belt.

The amended claims 1 to 19 meet the requirements of Article 33(3) PCT as endless belts of aluminum or aluminum alloy of thickness in the range of 1 to 2mm are considered to be an unexpected combination of material and physical dimension.

Industrial Applicability:
Claims 1 to 19 meet the criteria set forth in Article 33(4) PCT as the invention is useful in the casting industry.

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

Article 5 Defects

Incorporation by reference

page 1, line 30
page 6, line 30
page 10, line 13

These references in the disclosure may be permitted under the laws of some contracting states to the PCT.

CLAIMS:

1. A continuous belt casting apparatus for continuously casting metal strip, comprising:

at least one movable endless belt having a thickness in the range of 1 to 2 mm and having a casting surface at least partially defining a casting cavity,

means for advancing said at least one endless belt through the casting cavity,

means for injecting molten metal into said casting cavity, and

means for cooling said at least one endless belt as it passes through the casting cavity,

wherein said at least one endless belt is made of aluminum or an aluminum alloy.

2. The apparatus of claim 1, wherein the aluminum alloy is selected from the group consisting of AA5XXX and AA6XXX alloy systems.

3. The apparatus of claim 1, wherein the aluminum alloy is selected from the group consisting of AA5754, AA5052 and AA6061.

4. The apparatus of claim 1, wherein said at least one casting belt has a yield strength of at least 100 MPa.

5. The apparatus of claim 1, wherein said at least one casting belt has a thermal conductivity greater than 120 W/m-K.

6. The apparatus of claim 1, being a twin belt caster having two said endless belts made of said aluminum or aluminum alloy.

7. A process of casting a molten metal in a form of strip, which comprises: providing at least one casting belt made of aluminum or an

aluminum alloy having a thickness in the range of 1 to 2 mm and having a casting surface which at least partially defines a casting cavity, continuously advancing said at least one casting belt through the casting cavity, supplying the molten metal to an inlet of the casting cavity, cooling said at least one casting belt as it passes through the casting cavity, and continuously collecting the resulting cast strip from an outlet of the casting cavity.

8. The process of claim 7, wherein said step of supplying molten metal to the mould comprises supplying molten aluminum, magnesium, copper, zinc or an alloy of aluminum, magnesium, copper or zinc.

9. The process of claim 7, wherein said step of supplying molten metal to the casting cavity comprises supplying molten aluminum or an aluminum alloy.

10. The process of claim 7, wherein the step of supplying molten metal to the casting cavity comprises supplying an Al-Fe-Si or Al-Fe-Mn-Si alloy.

11. The process of claim 8, wherein the step of supplying molten metal to the casting cavity comprises supplying an Al-Mg or Al-Si-Mg alloy.

12. The process of claim 7, which further comprises a step of applying a parting agent to said casting surface before said at least one belt is advanced through the casting cavity.

13. The process of claim 7, which comprises providing a belt made of an aluminum alloy of the AA5XXX or AA6XXX alloy systems as said at least one casting belt.

14. The process of claim 7, which comprises providing a belt having a yield strength of at least 100 MPa as said casting belt.

15. The process of claim 7, which comprises providing a belt having a thermal conductivity greater than 120 W/m-K as said at least one casting belt.

16. A casting belt adapted for use in a continuous casting apparatus having at least one movable endless belt having a thickness in the range of 1 to 2 mm and provided with a casting surface at least partially defining a casting cavity, means for advancing said at least one endless belt through the casting cavity, means for injecting molten metal into said casting cavity, and means for cooling said at least one endless belt as it passes through the casting cavity, wherein said casting belt is made of aluminum or an aluminum alloy.

17. The casting belt according to claim 16, wherein the aluminum alloy employed for the casting belt is an alloy selected from AA5XXX and AA6XXX alloy systems.

18. The casting belt according to claim 16, wherein the casting belt has a yield strength of at least 100 MPa.

19. The casting belt according to claim 16, wherein the casting belt has a thermal conductivity greater than 120 W/m-K.